

CLAIMS

What is claimed is:

1. An apparatus, comprising:
a cycle redundancy check (CRC) calculator; and
a CRC nullifier coupled to the CRC calculator.
2. The apparatus of claim 1, wherein the nullifier is one of a plurality of nullifiers, each having an output, and wherein the apparatus further comprises an output multiplexer coupled to the plurality of CRC nullifiers to select the output of one of the plurality of CRC nullifiers.
3. The apparatus of claim 2, further comprising a data bus having N bytes coupled to the CRC calculator, wherein the plurality of CRC nullifiers comprise N-1 CRC nullifiers.
4. The apparatus of claim 2, further comprising:
a first input multiplexer coupled to the CRC calculator; and
a second input multiplexer coupled to the CRC calculator.
5. The apparatus of claim 4, wherein the first input multiplexer is coupled to receive a data byte input signal and a feed zero input signal.
6. The apparatus of claim 5, wherein the second input multiplexer is coupled to receive a default value input signal and a CRC input signal.

7. The apparatus of claim 6, wherein the first input multiplexer and the CRC calculator are each coupled to receive a byte enable signal.
8. The apparatus of claim 2, wherein the CRC calculator performs a closed loop function and wherein the plurality of CRC nullifiers perform an operation outside of the closed loop function.
9. The apparatus of claim 1, wherein the CRC calculator and the CRC nullifier reside in a framer and wherein the apparatus further comprises:
 - a link layer device coupled to the framer; and
 - a physical interface coupled to the framer.
10. The apparatus of claim 9, wherein the physical interface is coupled to a first optical network and the link layer device is coupled to at least one of a second optical network and a copper network.
11. A method, comprising:
 - receiving data on an input data bus having a N byte width, where N is greater than one; and
 - passing the data from the input data bus to a cycle redundancy check (CRC) computation circuitry having a CRC calculator and at least one nullifier.
12. The method of claim 11, further comprising receiving an end of packet character in the data and performing a byte validation operation only when the end of packet character is received.

13. The method of claim 11, further comprising:
performing a closed loop calculation function using the CRC calculator;
and
performing a nullification function outside of the closed loop calculation function using the at least one nullifier of a plurality of nullifiers.
14. The method of claim 13, wherein closed loop calculation function is performed in a first cycle and wherein the nullification function is performed in one or more cycles following the first cycle.
15. The method of claim 13, further comprising performing an available transfer check and determining if a Start Of Packet character is available, before the performing of the closed loop calculation function.
16. The method of claim 15, further comprising:
determining if a byte valid value is equal to the input data bus width; and
appending zeros to an invalid data field if the byte valid is not equal to the input data bus width.
17. The method of claim 16, wherein performing the closed loop calculation function comprises:
computing a CRC value over the input data bus width using the CRC calculator;
determining if the current transfer does not contain an End Of Packet (EOP)

character and, if so, feeding the calculated CRC value back as an old CRC value to the CRC calculator; and

determining if the current transfer contains the EOP character

18. The method of claim 17, wherein nullification function is performed if the current transfer contains the EOP character and if the byte valid value is not equal to the input data bus width.

19. The method of claim 18, wherein performing the nullification function comprises:

determining if the byte valid value is equal to the input data bus width and,

if so, obtaining an actual CRC value based on the byte valid value, and

if not, passing the CRC value through a corresponding one of the plurality of nullifiers to get the actual CRC value based on the byte valid value.

20. An apparatus, comprising:

means for performing a closed loop calculation function using cycle redundancy check (CRC) calculator; and

means for performing a nullification function outside of the closed loop calculation function using a nullifier.

21. The apparatus of claim 20, further comprising means for performing an available transfer check and determining if a Start Of Packet character is available.

22. The apparatus of claim 21, further comprising:

means for determining if a byte valid value is equal to the input data bus width; and

means for appending zeros to an invalid data field if the byte valid is not equal to the input data bus width.